the state courts. *In re Thompson's Estate,* 179 Okla. 240, 65 P. 2d 442. The statute, that is, had in mind the judicial process of ascertaining the heir and the completion of that process by court action whereby the land was "turned over" to the ascertained heir. And so here, when the Oklahoma court decreed that Pitts was Mamie's heir, the land in the sensible use of the phrase "turned over" was turned over to Pitts.

Other arguments have not been overlooked but they need not be separately considered.

Affirmed.

MR. JUSTICE JACKSON dissents.

DOW CHEMICAL CO. *v.* HALLIBURTON OIL WELL CEMENTING CO.

NO. 50. CERTIORARI TO THE CIRCUIT COURT OF APPEALS FOR THE SIXTH CIRCUIT.*

Argued February 6, 1945.—Decided March 5, 1945.

1. To resolve a conflict between Circuit Courts of Appeals as to the validity of a patent, this Court will determine independently the factual issue of validity. P. 322.
2. Grebe and Sanford Patent No. 1,877,504, Claims 1, 5, 7, 8 and 9, for a method of treating deep wells to increase production, *held* invalid for want of invention. Pp. 324, 331.

   In the described process there was no patentable invention in any of the following claims or any combination thereof: (1) addition of an inhibiting agent to the hydrochloric acid solution to prevent corrosion; (2) use of a dilute rather than a concentrated hydrochloric acid solution; (3) use of the ordinary pump tube instead of a specially protected supply pipe to introduce the acid into the well.
3. The application of an old process to a new and analogous use lacks the very essence of an invention. P. 327.

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*Together with No. 61, *Halliburton Oil Well Cementing Co.* v. *Dow Chemical Co.,* also on certiorari to the Circuit Court of Appeals for the Sixth Circuit.

4. The mere addition of water to dilute a known chemical solution does not entitle one to a patent monopoly, at least unless a definite dilution point or range is discovered corresponding to a physical phenomenon. P. 329.
5. The mere substitution of equivalents which do substantially the same thing in the same way, even though better results may be produced, is not such an invention as will sustain a patent. P. 330.
6. That a claimed invention filled a long felt want and has been a commercial success is relevant only when the question of invention is otherwise in doubt. P. 330.

139 F. 2d 473, affirmed.

CERTIORARI, 322 U. S. 719, on cross-petitions by a patent owner (petitioner in No. 50) and an alleged infringer (cross-petitioner in No. 61), to review the affirmance of a decree holding invalid certain claims of a patent and dismissing the complaint in a suit for infringement.

Messrs. Bernard A. Schroeder and *Charles J. Merriam,* with whom *Messrs. Russell Wiles, Wilber Owen, Calvin A. Campbell* and *Don L. Conner* were on the brief, for the Dow Chemical Co.

Mr. Leonard S. Lyon, with whom *Messrs. Frederick S. Lyon* and *Earl Babcock* were on the brief, for the Halliburton Oil Well Cementing Co.

MR. JUSTICE MURPHY delivered the opinion of the Court.

In issue here is the validity of United States Patent No. 1,877,504, relating to "the treatment of deep wells, such as oil, gas, brine or water wells, to increase the output therefrom," issued to John J. Grebe and Ross T. Sanford on September 12, 1932.

Petitioner, the owner of the patent, brought this suit against respondent for alleged infringement. Both the District Court for the Eastern District of Michigan and the Sixth Circuit Court of Appeals held the patent invalid for want of invention and denied relief. 139 F. 2d

473. Previously the Tenth Circuit Court of Appeals, in reversing the judgment of the District Court for the Northern District of Oklahoma, had held the patent valid and infringed in a suit brought by petitioner against another party. *Dow Chemical Co.* v. *Williams Bros. Well Treating Corp.*, 81 F. 2d 495, cert. denied, 298 U. S. 690. The conflicting views of the appellate courts concerning the validity of the same patent led us to grant certiorari in this case, 322 U. S. 719, and oblige us to decide independently the factual issue of validity. *Universal Oil Co.* v. *Globe Co.*, 322 U. S. 471, 473.

The stated object of the Grebe-Sanford patent is "to counteract some preventable natural causes for the decline of yield of a well" where the well has been drilled into a limestone or other calcareous formation. As oil is pumped from a well, the underground flow to the well decreases and the yield declines until pumping is no longer profitable. Yet it is known that when that point is reached there often remains embedded in the rock formation a great deal of oil unrecoverable by ordinary processes. Many methods have been suggested to recover this hidden oil. The forcing of water or gas into the rock formation, the heating of the surrounding rock and the use of explosives have all been proposed but found wanting in one way or another.

Eventually, however, the idea was conceived of using acid to dissolve the limestone, thus opening channels through which the oil could flow into the well. This idea first appears to have been developed in United States Patent No. 556,669, issued on March 17, 1896, to Herman Frasch, with a half interest being assigned to John W. Van Dyke. The essence of this patent was the introduction into the oil well of a large solution of hydrochloric acid under pressure, with fresh water being added later to force the acid further into the limestone. Frasch recommended the use of commercial hydrochloric acid containing from 30% to 40% by weight of the acid gas

HCl; he further recommended that the acid remain in the well for twelve hours. A suitably arranged packer was to be used to confine the acid to the lower or oil-yielding portion of the well hole.

Frasch also recognized that the hydrochloric acid was likely to corrode the metal well equipment. Hence the patent suggested that the regular well tubing be removed and that an enameled or lead-lined pipe be inserted to conduct the acid down into the well, "or it may be otherwise made proof against corrosion." An additional suggestion was that an alkaline liquid be introduced to neutralize the acid after it had performed its function.

Frasch's method proved successful in disintegrating limestone rock and increasing the flow of oil. The record shows that at least fourteen commercial wells near Lima, Ohio, were treated with this process in 1895 and 1896, resulting in substantial production increases in most instances. Wide publicity was given to these operations. But despite this success, Frasch and Van Dyke soon discontinued their work along these lines. The reasons for this abandonment are not clearly disclosed by the record. Respondent suggests personal reasons on the part of Frasch and Van Dyke and claims that the relatively undeveloped oil industry at that time had little use for such an invention. Petitioner, however, contends that Frasch's method was so cumbersome and expensive that it was commercially impracticable; [1] such is also the reason advanced by the court in the *Williams Bros.* case, 81 F. 2d at 496.

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[1] Petitioner argues that (1) Frasch used concentrated acid that was so corrosive as to compel the use of the costly and cumbersome expedient of removing the ordinary well tube and inserting a special acid supply pipe; (2) concentrated acid being less effective than diluted acid in reacting on the limestone rock, the production increases achieved by Frasch were too small to justify the expense of the treatment; and (3) viscous spent acid was difficult to remove under the Frasch method from the pores of the rock and hence blocked or lessened the flow of oil to the well hole.

Whatever the reason for the failure of the Frasch method to achieve wide-spread use, the Grebe-Sanford patent in issue claims to be an improved method of treating wells with a hydrochloric acid solution. The patent expressly recognizes the Frasch treatment but states that it was never generally adopted "due to the fact that the acid attacks the metallic casing, pump tube, etc. about as actively as the rock, and causes serious damage thereto." To meet this alleged defect, the Grebe-Sanford patent proposes the use of a hydrochloric acid solution containing "a small amount of a substance capable of inhibiting attack of the acid upon metal surfaces . . . with which it comes in contact." The preferred inhibiting agent is one of several specified arsenic compounds, to be added in the amount of from 1% to 5% of the weight of the solution. Numerous other inhibitors are also suggested. The patent further states that "the strength of the aqueous hydrochloric acid solution, in general best adapted to the purpose in hand, may be between about 5 per cent and about 20 per cent, and preferably should be between 10 and 15 per cent although other concentrations may be used, if desired." Claim 8 (claims 1, 5, 7, 8 and 9 are in issue) best sums up the preferred form of the Grebe-Sanford process:

"The method for increasing the output of an oil well which comprises charging into the pump tube a quantity of a 5 to 20 per cent hydrochloric acid solution containing a relatively small amount of a corrosion inhibitor, expelling the acid from the tube into the bore of the well by applying pressure thereon, permitting the acid to act upon the rock formation surrounding the well cavity and withdrawing the spent acid."

The parties differ as to the precise scope of the alleged patentable improvement over the Frasch method of acidizing wells. Respondent urges, and the two courts below held, that the sole object of the Grebe-Sanford

process is simply to protect the well equipment from corrosion by adding an inhibiting agent to the hydrochloric acid solution.[2] Petitioner has consistently claimed, on the other hand, that the patent specifies three novel points which elevate the described process to the level of an invention: (1) the addition of an inhibiting agent to the hydrochloric acid solution to prevent corrosion; (2) the use of a dilute rather than a concentrated hydrochloric acid solution; and (3) the use of the ordinary pump tube instead of a specially protected supply pipe to introduce the acid into the well. Assuming without deciding that petitioner's version of the alleged improvement is correct, however, we hold that no one of these three claims and no combination thereof evidences that degree of skill and ingenuity which constitutes the essential ingredient of a true invention.

(1) *The addition of an inhibiting agent.* It is clear that the Grebe-Sanford suggestion that an inhibiting agent, preferably an arsenic compound, be added to the hydrochloric acid solution presents no patentable advance over the prior art. Petitioner makes no claim that the inhibiting agent in any way affects the chemical action of the acid on the limestone rock; it states merely that the inhibitor acts so as to prevent or restrict the corrosive effect of the acid on the metal well tubing and equipment. But long before the Grebe-Sanford process was patented it had been known that inhibiting agents could be used to protect metals from acid solutions. More particularly, it

[2] One of petitioner's experts testified that the main claim of the Grebe-Sanford patent is the addition to the hydrochloric acid of some material which will inhibit the action of the acid and that the claimed result "would be limited apparently to the equipment, rather than to the well itself." He stated further that the suggested inhibitors "would have no effect on the acid, in connection with its reaction upon limestone" and that they "have a specific function on the metal equipment used in connection with the well treatment."

was well known that arsenic compounds mixed with hydrochloric acid solutions acted as effective inhibitors and numerous patents embodying that principle had been granted.[8] Various inhibitors were available on the market at the time of the conception of the Grebe-Sanford process and were used extensively in the commercial pickling of iron and steel products in acid solutions and in the transportation of acids in metal containers.

There was evidence, moreover, that in 1928 and 1929 the Gypsy Oil Company had successfully used inhibited hydrochloric acid to remove scale from certain of its oil wells drilled in sandstone formations. This process was based upon a report made on behalf of the Mellon Institute at Pittsburgh at the request of the Gypsy Oil Company, which had been bothered by the formation of scale on the metal well equipment. The report, after noting that "the selection of a solvent was a simple matter" and that "the commercial use of inhibitors for the protection of metals in acid solutions is not new," recommended the removal of the scale by the use of a hydrochloric acid solution treated with an inhibitor obtainable on the market. Even if petitioner be correct in labeling this Gypsy Oil Company use as an abandoned experiment not amounting to anticipation, it is significant that the use of an inhibitor to check the hydrochloric acid from corroding the metal well equipment while attacking the scale suggested itself without trouble.

Thus prior to the patenting of the Grebe-Sanford process in 1932 the following facts were manifest and ele-

[8] See, for example, Patent to Beneker, No. 914,916 (1909); Patent to Gravell, No. 1,678,775 (1928). For patents involving the use of inhibitors other than arsenic compounds, see Patent to Holmes, No. 1,470,225 (1923); Patent to Rhodes, No. 1,746,677 (1930); Patent to Rhodes, No. 1,746,678 (1930); Patent to Vignos, No. 1,750,651 (1930); Patent to Harrison, No. 1,766,902 (1930); Patent to Corson, No. 1,773,953 (1930); Patent to Calcott, No. 1,785,513 (1930); Patent to Burke, No. 1,789,805 (1931).

mentary to any one skilled in the art: (a) hydrochloric acid would dissolve limestone and increase the production of oil wells, as demonstrated by the Frasch patent; (b) hydrochloric acid would also corrode metal with which it came in contact; (c) arsenic compounds and other chemicals could be added to hydrochloric acid to inhibit this corrosive effect; and (d) inhibited hydrochloric acid could effectively be utilized to remove scale from metal well equipment without corroding the metal. A representative of the Pure Oil Company then suggested to Grebe and Sanford the possibility of acidizing oil wells to increase production. The latter, from their knowledge of brine well acidizing and of corrosion inhibition, immediately recommended the use of hydrochloric acid containing an inhibitor. Grebe and Sanford at this time apparently did not know about the Frasch patent. But spurred by the suggestion of the Pure Oil Company, they worked out the process in issue on the basis of known facts and reactions.

All the Grebe-Sanford process taught was the obvious fact that hydrochloric acid could be inhibited to prevent corrosion while being used to dissolve limestone rock pursuant to the Frasch method of acidizing wells. No new mental or physical operation was required to add, as suggested by the Grebe-Sanford process, an arsenic compound of from 1% to 5% of the weight of a hydrochloric acid solution. No new or unexpected results were obtained by the addition of such an inhibitor. It was perfectly plain to an expert that the metal well equipment would thereby be protected from corrosion. The Grebe-Sanford method, in short, involved in this respect no more than a mere application of an old process of inhibition to a new and analogous use of protecting metal well equipment from corrosion when the well is being acidized to increase production. Such a process lacks the very essence of an invention. See *Electric Cable Co.* v. *Brooklyn Edison Co.*, 292 U. S. 69, 79, 80; *Paramount Publix Corp.* v.

American Tri-Ergon Corp., 294 U. S. 464, 473; *Cuno Engineering Corp.* v. *Automatic Devices Corp.*, 314 U. S. 84, 89.

The fact that prior to 1932 no one had apparently thought to use an inhibitor while acidizing an oil well to increase production cannot inject into the Grebe-Sanford process the attributes of an invention. Especially is this so since there is no evidence of any one trying unsuccessfully to inhibit hydrochloric acid for such purposes. He who is merely the first to utilize the existing fund of public knowledge for new and obvious purposes must be satisfied with whatever fame, personal satisfaction or commercial success he may be able to achieve. Patent monopolies, with all their significant economic and social consequences, are not reserved for those who contribute so insubstantially to that fund of public knowledge.

(2) *The use of a dilute rather than a concentrated hydrochloric acid solution.* Petitioner lays great stress on the fact that the Grebe-Sanford process suggests the use of a dilute hydrochloric acid solution containing only 5% to 20% HCl (preferably 10% to 15%). It is pointed out that Frasch's patent called for the use of commercial hydrochloric acid, which contains from 30% to 40% of HCl, and that in some of his treatments from 27% to 28% was actually used. Petitioner claims that the dilution recommended by the Grebe-Sanford process substantially reduces the viscosity of the acid, greatly slows its reaction on limestone (thus allowing the acid to open up channels distant from the well hole instead of spending itself immediately and entirely on the nearby rock) and greatly reduces its corrosive action on iron and steel.[4]

Nothing appears in the Grebe-Sanford patent claims, however, to support the thesis that dilution is part of the

[4] There was evidence introduced to the effect that a hydrochloric acid solution is much more corrosive when it contains 30% HCl than when it contains from 5% to 20%.

alleged invention. The main concern seems to have been directed at the failure of Frasch to recommend the use of an inhibiting agent. The suggested strength of the Grebe-Sanford solution is merely the one "in general best adapted to the purpose in hand" and it is said that "other concentrations may be used, if desired." Apparently dilution is recommended since the inhibiting agent can act more effectively with a weaker acid, which is obviously less corrosive than a more concentrated acid. At the same time, the recommended dilution allows the solution to be of a strength such that the soluble salts formed by its action on the rock will remain dissolved therein. The patent does not state that an acid outside the range of 5% to 20% strength will fail and no affirmative advantage over the Frasch method is claimed insofar as the strength of the acid is concerned.

But even assuming that a dilute solution is an ingredient of the alleged invention, we can find none of the elements of true invention adhering thereto. The mere addition of water to dilute a known chemical solution does not entitle one to a patent monopoly, at least unless a definite dilution point or range is discovered corresponding to a physical phenomenon. *Kwik Set, Inc.* v. *Welch Grape Juice Co.*, 86 F. 2d 945, 947. No such discovery was made here. The advantages said to accompany a dilute solution do not correspond to any particular dilution point or range. The patent recommends that the acid be diluted to a 5% to 20% strength but it is recognized that "other concentrations may be used, if desired," to achieve the purpose at hand. Such a broad and indefinite specification as to dilution is fatal to a claimed invention.

(3) *The use of the ordinary pump tube.* The Grebe-Sanford patent mentions the use of the ordinary pump tube to convey the acid to the bottom of the well hole, whereas the Frasch patent had contemplated withdrawal of

the ordinary pump tube in favor of a smaller and specially protected supply tube. But this is at most an incidental and unimportant part of the Grebe-Sanford method, as is recognized by the statement in the patent that "it is not necessary, however, to add the acid solution through the pump tube, as any other convenient way may be employed." No new function is performed by the pump tube that is not performed by the Frasch supply tube; both merely convey the acid to the bottom of the well hole. Any advantage in cost or simplicity which the use of the ordinary pump tube may give is the result of the use of an inhibitor in the acid rather than any intrinsic merit of the pump tube. It is elemental that the mere substitution of equivalents which do substantially the same thing in the same way, even though better results may be produced, is not such an invention as will sustain a patent. *Dunbar* v. *Myers,* 94 U. S. 187, 199; *Smith* v. *Nichols,* 21 Wall. 112, 119.

Finally, petitioner claims that the Grebe-Sanford process has filled a long felt want and has been a commercial success. But these considerations are relevant only in a close case where all other proof leaves the question of invention in doubt. *Smith* v. *Hall,* 301 U. S. 216, 233; *McClain* v. *Ortmayer,* 141 U. S. 419, 428, 429. Here the lack of invention is beyond doubt and cannot be outweighed by such factors. Moreover, there is an absence in this case of any long felt want or of any recognized problem that had baffled the contemporary art. There is no evidence that any one with knowledge of the Frasch method and with knowledge of the use of inhibitors in hydrochloric acid ever tried unsuccessfully to use the Frasch method with inhibited hydrochloric acid. Nor is there any proof of fruitless demands and efforts to prevent corrosion while acidizing oil wells. Whenever the need arose to prevent corrosion in the use of hydrochloric acid, whether for purposes of pickling, scale removal or oil

well acidizing, the addition of inhibitors was suggested immediately and without effort. The great fund of public knowledge was simply drawn upon the first time the problem was considered, resulting in the obvious process described in the Grebe-Sanford patent.

Since we conclude that the Grebe-Sanford patent is invalid for want of invention, we need not consider respondent's cross-petition raising questions as to whether respondent's process infringed the patent.

Affirmed.

COMMISSIONER OF INTERNAL REVENUE *v.* COURT HOLDING CO.

CERTIORARI TO THE CIRCUIT COURT OF APPEALS FOR THE FIFTH CIRCUIT.

No. 581. Argued February 26, 1945.—Decided March 12, 1945.

1. There was evidence to support the finding of the Tax Court that the transaction in question—formally a sale by stockholders of property conveyed to them as a "liquidating dividend"—was a sale by the corporation rather than by the stockholders, which finding must therefore be accepted by the courts; and the Tax Court's conclusion that, under § 22 of the Internal Revenue Code, the corporation was taxable on the gain from the sale is sustained. P. 333.
2. That the corporation never executed a written agreement, and that an oral agreement for the sale of realty was unenforcible under the state law, does not require a different result, in view of the Tax Court's finding that the executed sale was in substance a sale by the corporation. P. 334.

143 F. 2d 823, reversed.

CERTIORARI, 323 U. S. 702, to review the reversal of a decision of the Tax Court, 2 T. C. 531, sustaining the Commissioner's determination of a deficiency in income tax.

Assistant Attorney General Samuel O. Clark, Jr., with whom *Solicitor General Fahy, Messrs. Sewall Key, Harry Baum,* and *Miss Helen R. Carloss* were on the brief, for petitioner.